

The Effect of Alcoholic Drinks on the Human Mind and Body

WHAT ATHLETICS HAVE TAUGHT.

THE most popular sport in America is baseball. Many of the large cities have one or two professional teams composed of men picked from all over the country. Thousands of dollars are paid every year to see the games, and the teams for the most part are so evenly matched that only a slight superiority on either side decides the victory. Managers are constantly on the outlook not only for the best players with keen minds and active muscles, but they try by training to keep them in condition for the finest work.

"The entrance requirements to the Athletics' School of Applied Baseball are not many," said Connie Mack,¹ manager of the Philadelphia Athletics which for two years in succession won the championship series, "but each candidate must meet every requirement. He must have speed (except in the case of pitchers), brains and ambition. . . . A major leaguer with a career on the diamond before him must cut out all bad habits." Of the twenty-five players on the "Athletics'" team

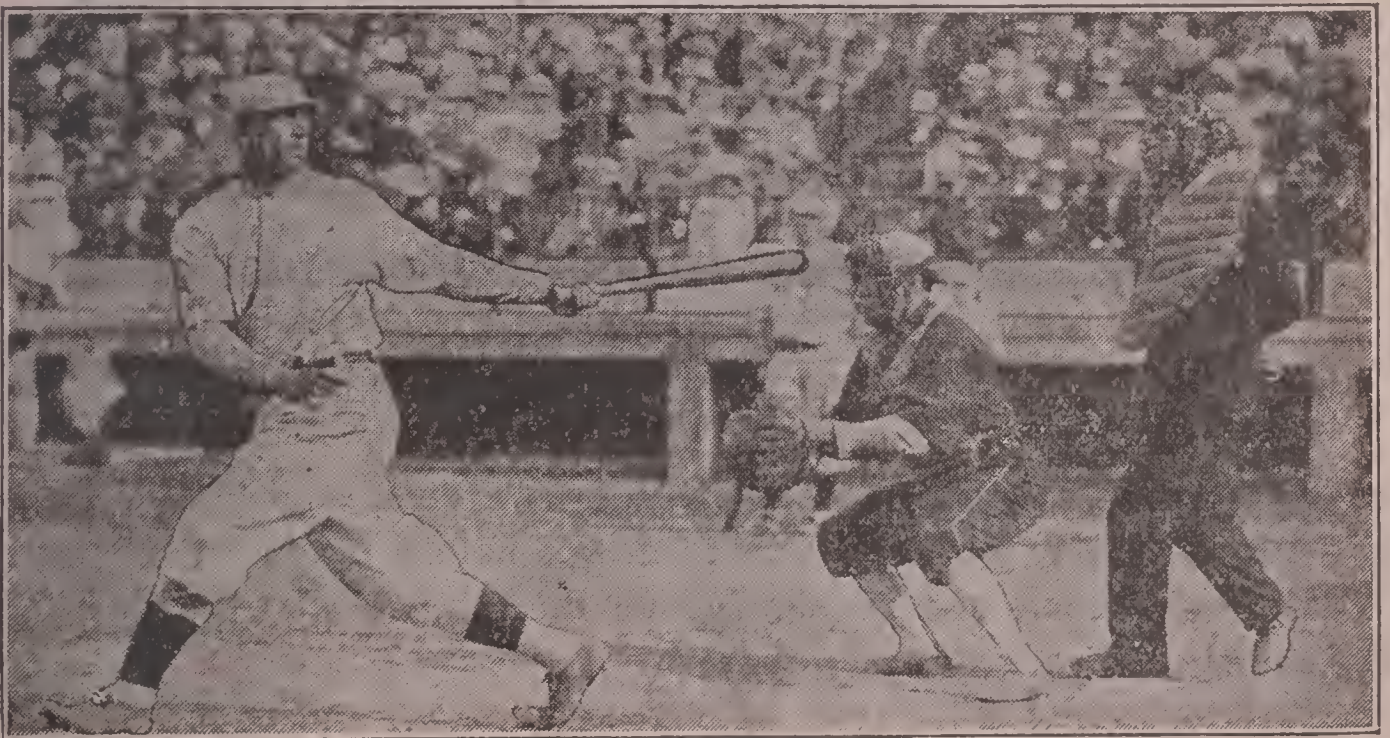


Photo by Boston Post.

Fig. 1. "Baseball men are not now of the drinking class. The fact is that a big-league player has to be in trim day in and day out or he is sent to the minors. It's the survival of the fittest."—Connie Mack, Manager Philadelphia "Athletics" Baseball Team.

that won the world championship in 1910, "fifteen," said Mr. Mack,² "don't know the taste of liquors," and at the request of the manager the entire team went through the championship games in both 1910 and 1911 without drinking even a single glass of beer.

While many factors are necessary to make a winning team so that the same one may not win year after year, baseball managers recognize that if their men are free from drink they stand a better chance of doing the best work. The manager of the Pittsburgh team forbade the use of alcoholic beverages by his men throughout the playing season of 1912, and the manager of the Chicago "Cubs" announced that his men would have to agree to entire abstinence during the season of 1913.

Football.—Not only in baseball, but in other sports, young men are finding the use of alcoholic drinks a handicap.

"No one can honestly say that alcohol is of value to athletes," said Ted Coy, captain of the Yale football team in 1909-10. "There are not even two sides to the question. I've seen several good athletes spoiled by drink as far as athletics are concerned."³

Running and Walking.—Marathon races have shown that alcohol not only impairs one's chances of winning, but that it adds seriously to

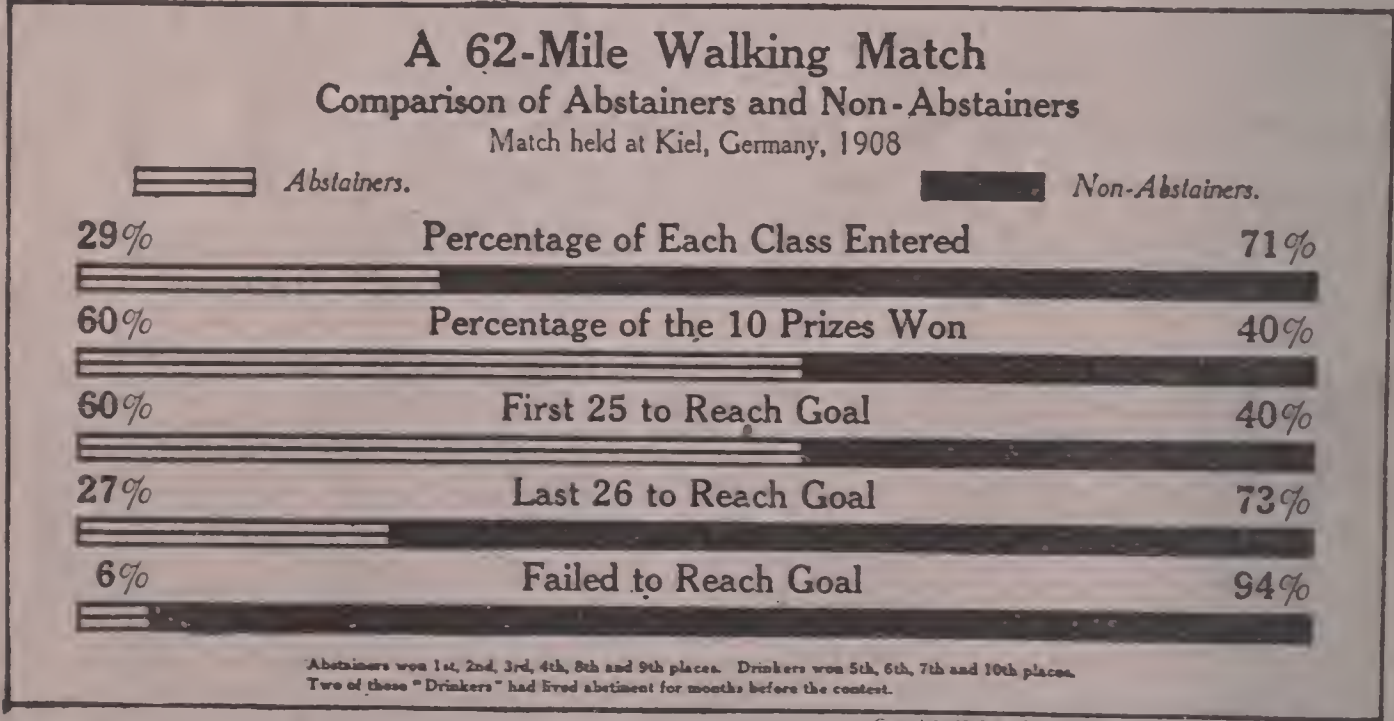


Fig. 2. See page 6.

the dangers of a long strain. The managers of the Boston annual Marathon run positively forbid⁴ alcoholic drinks before or during the race, because their experience has shown that the runners who use them become exhausted earlier than without it.

Striking comparative tests of physical strength and endurance also show on a large scale the advantage of abstinence over even the moderate use of alcohol.

An Actual Test.—Such a test was the long-distance match held in Germany a few years ago (FIG. 2). The course was sixty-two miles.⁵ Prizes were to be given to the first ten men covering the distance. Eighty-one men entered the match, of whom only twenty-four (29 per cent) were abstainers. The first four men who crossed the line before

the cheering crowd of 20,000 people were abstainers. Of the ten prize winners, six were habitual abstainers, and two of the other four winners had been abstaining for some time while in training for the match.

Still more important than the winning was the better endurance of the abstainers in this contest. More than half of the non-abstainers fell out by the way, but only two of the twenty-four abstainers. Endurance is an essential in work requiring a long strain.

Speed, agility, quick-wittedness, strength, endurance, all these are needed by the successful athlete, and experience shows that alcohol may

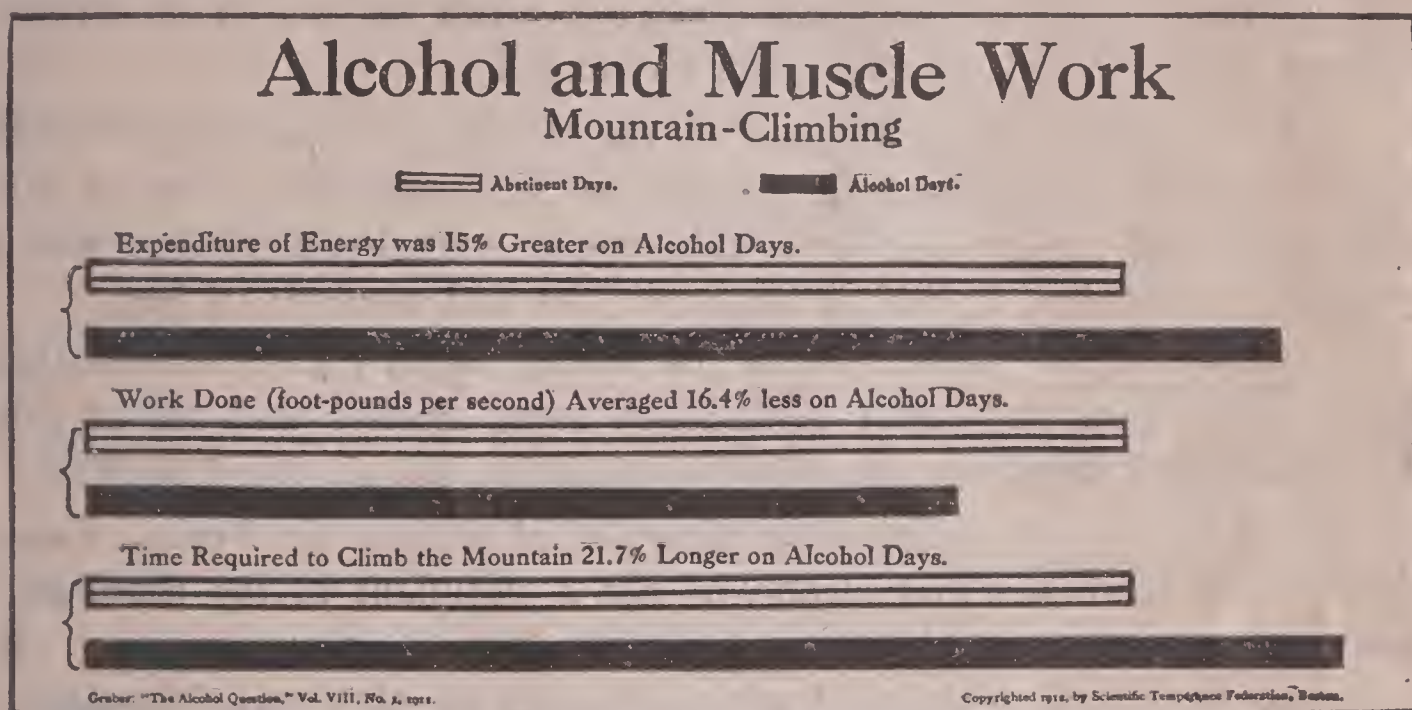


Fig. 3. For explanation see page 8.

impair any one or all of these qualities, so that, in the words of the Australian swimmer; Beaurepaire, "ALCOHOL IS DISASTROUS TO ATHLETES."

THE RELATION OF ALCOHOL TO WORK.

Many whose muscle is their capital have believed that their daily drink gives them strength and enables them to hold out through a long day's work. When careful tests are made, it is found that quite the opposite is true.

Effect on Endurance.—During one of his campaigns with the British army, General Wolseley tried out the effect of alcoholic drinks on endurance. To some of his troops he gave alcohol, to others none, and watched the results. The test showed conclusively that the water drinkers were fresher, livelier and marched better than those that had alcohol. The difference was so marked that General Kitchener later, in a campaign calling for special exertion, gave strict orders that no alcoholic drinks of any kind should be taken with the army.

Efficiency—Experiments have been made by individuals to test the working power and endurance with and without alcohol. A few years ago, Professor Durig,⁶ an expert mountain climber, carried out a series

of experiments, climbing in each case to the summit, 8,000 feet high, of Mt. Bilkenrat, in the Alps. He took account of the height to which he climbed, the weight of his body and his pack, and he carried instruments by which he was able to measure exactly how much bodily energy he put forth, the amount of muscle work he did, and the length of time it took to do it. Before beginning the climb, on certain days he took alcoholic drink equivalent to 2 or 2 1-3 glasses of beer, and found, to his surprise, that although the instruments indicated (FIG. 3) that he had expended 15 per cent more energy than on the abstinent days, his watch showed that it took 21.7 per cent longer to reach the top of the mountain than on the days when he took no alcohol.

Other tests have been made of the effects of alcohol on muscle work showing that from 8 to 10 per cent less work was done on the days when the worker drank one-half pint of wine, the alcohol in which would be equivalent to that in a pint or pint and one-half of beer.⁷

Taking Off the Brakes.—But the worker usually has the idea that he is doing more and better work when using alcohol, and out of this has grown the erroneous idea that drink helps one do hard work.

This idea is due to the drug effects of alcohol on the brain. Careful tests have shown that alcohol is not a stimulant to the brain and nervous system, as was long supposed, but instead, depresses them. It is a drug belonging to the same group of drugs as ether and chloroform, and like these other narcotics, has a paralyzing effect on the nervous centers of control.

But even smaller quantities, a glass or two of wine or beer, slightly impair the power of self-control and self-restraint, giving one the delusive feeling that he is acting more easily and effectively. This greater activity which may appear for a short time after a dose of alcohol is taken is a stage of excitement similar to that often shown by a patient when going under ether or chloroform. The increased action of the muscles is not due to increased strength, but to lessened control of them. It is somewhat like the action of an automobile which shows more speed when the brakes fail to work properly, simply because it is not under full control.

Self-Judgment Impaired.—Alcohol also impairs the power of self-judgment, leading one to suppose that he is doing more or better work than he actually is doing; or, acting as a narcotic, the alcohol may deaden for a time the feeling of weariness without really removing the cause, so that the person believes that the use of alcohol rests him, when it is simply adding to his fatigue. Often when its influence passes off he feels depressed again and thinks he must take another drink to overcome the depression.

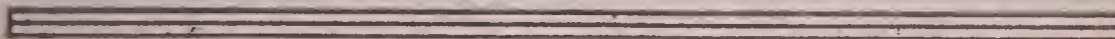
Self-Control Weakened.—"Why doesn't he control himself?" is sometimes asked when a person has become intoxicated. Because he has used a substance that has power to rob one of that very self-control which should say to the user, "Stop.". Some people are more quickly affected by alcohol than others. The same person may be more easily affected at one time than at another. But no one can be sure that he can "control himself" in the use of a substance like alcohol, one of whose first effects is to impair self-control. It belongs to the class of habit-forming drugs like opium and morphine, which, as everyone knows, tend to create a craving for increasing amounts. No one can tell in advance whether alcohol will so affect him, and when he finds out, it is often too late. THE SAFEST BRAIN IS AN UNDRUGGED BRAIN.

EFFECT OF ALCOHOL ON SKILL.

Alcohol lessens skill and precision in fine work where head, hand, eye, muscles and nerves must work together for deftness and accuracy.

Alcohol and Precision as Shown by Marksmanship

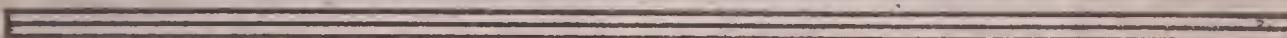
1st Tests. No Alcohol—Average No. of Hits 23



2nd Tests. Alcohol Taken—Average No. of Hits 3



3rd Tests. No Alcohol—Average No. Hits 26



Experiments by Lieut. Bengt Boy, (Sweden, 1904.)

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Fig. 4. For explanation see page 9.

Fewer hits were made on the alcohol days, but the soldiers thought they were shooting better.

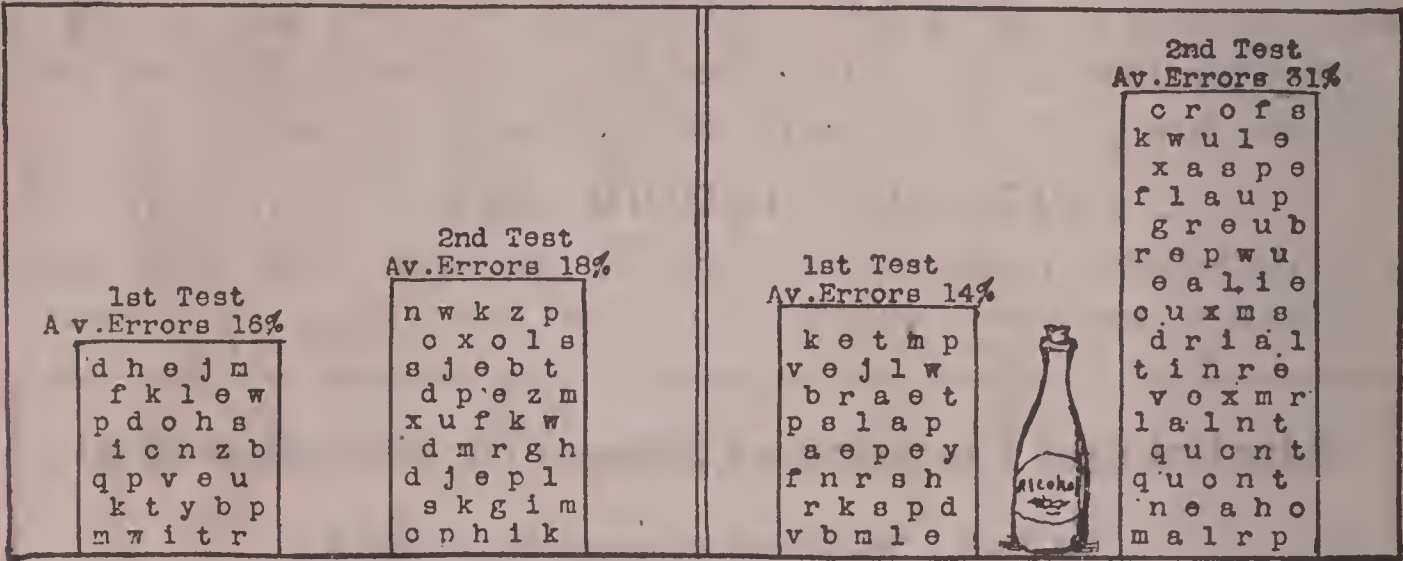
Marksmanship.—A series of target-shooting trials in Sweden showed clearly the advantage of abstinence when skill is required. A group of soldiers⁸—three corporals and three privates—took part in three series of tests, each lasting several days.

During the first and third series the men were entirely abstinent; for the second series—the alcohol days—they took about two-thirds of a wineglass of brandy (34-44 grams of alcohol) from 20 to 30 minutes before the firing, and an equal amount of alcohol in punch on the evening before.

In tests for precision, it was found that on the alcohol days the men made fewer points than when they had no alcohol. In the quick-firing tests (FIG. 4), on the alcohol days they hit the target on the average only 3 times out of 30 shots fired in quick succession, but on the two series of abstinent days the average was 23 and 26 hits.

Typesetting and Typewriting.—Four typesetters in a printing office in Heidelberg, Germany, were tested in their work to find out if alcohol helped or hindered them.⁹ The trials were carried on for an hour a day for four successive days. The first and third days no alcohol was taken; on the second and fourth days the work was done after drinking about three-quarters of a tumbler of Greek wine (18 per cent alcohol). Alcohol used in these amounts to which the men were accustomed decreased the amount of work done about 9 per cent on the average.

ERRORS IN TYPEWRITING INCREASED BY ALCOHOL



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Fig. 5. Each column represents the amount of typewriting done in a given time. On days when no alcohol was taken (first two columns), in the first test sixteen errors were made in every 100 characters written; in the second test there were on the average eighteen errors in each 100 characters written, an increase due to fatigue of 12 1-2 per cent.

In the second series of days in tests made without alcohol (column three) the average number of errors was fourteen per hundred characters written, showing that better work was being done than on the other days. But after taking 1.3 oz. alcohol (equivalent to that in about three glasses of beer) there were thirty-one errors in every 100 characters an increase of 121 per cent. Even allowing for the effects of fatigue, alcohol greatly increased the errors, thus impairing efficiency. (Experiments by Kraepelin.)

This meant that if the same loss held for a whole day's work, if a man were capable of earning \$15.00 a week when not drinking, he would earn only \$13.65 if he drank as much alcohol daily as would be contained in a quart of beer.

This typesetting test showed that the *amount* of skilled work done was diminished by alcohol. In a test by typewriting it was found that alcohol increased the number of *errors* (FIG. 5).

BRAIN WORK IMPAIRED BY ALCOHOL.

Many experiments have been made in studying the effects of alcohol on special kinds of brain work, a large number of them by Professor Kraepelin, now of the University of Munich, with the help of medical students in his department, Professor A. Smith and others.

Memory.—Even a child early learns that there are many things he has to remember or to commit to memory. Spelling lessons, the multiplication table, facts in geography, history, science, are learned only as

memory enables him to retain them. But in many finer and more delicate ways memory is an important part of mental life.

To test the effects of daily doses of alcohol on the ability to memorize, rows of figures were learned on days when no alcohol was taken (FIG. 6), and other rows on days when the student used as much alcohol as would be contained in from two to four glasses of beer.

The result showed¹⁰ that on the average fewer numbers were learned on the alcohol days.

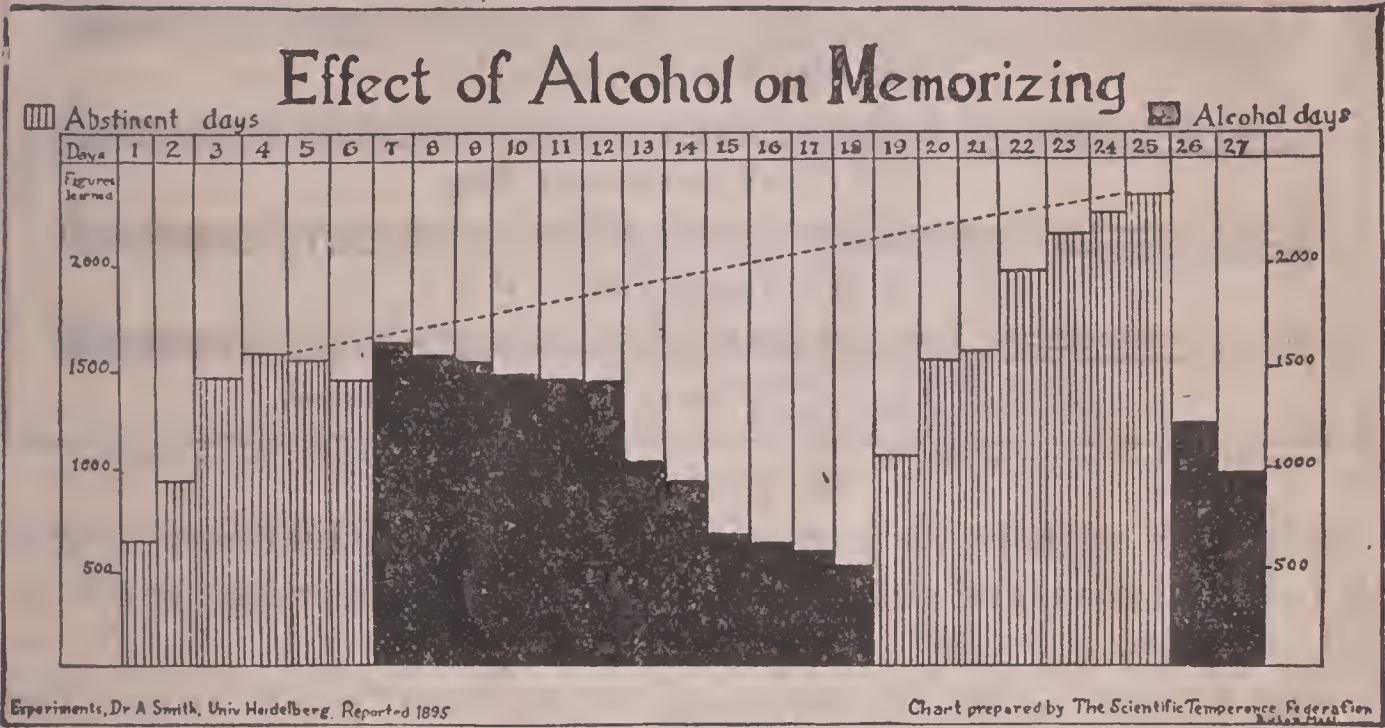


Fig. 6. Height of columns represents the number of figures learned each day. Increase from day to day on abstinent days shows the gains made by practice. Decrease of fifth and sixth days due to temporary illness, and on the sixth day one dose of alcohol was taken. Dotted line from fourth to twenty-fifth days shows the normal rate of increase. Alcohol in amount equal to that in from two to four glasses of beer (40-80 grms.) taken on the alcohol days. Memorizing done eight or ten hours after taking the alcohol. Amount of work done on the twelfth alcohol day about 70 per cent less than it should have been, and was less even than was done on Day one.

Work similar to that done by every school pupil was tried by Professor Vogt, of the University of Christiania, who committed to memory daily 25 lines of Greek poetry,¹¹ and recorded the number of minutes required to learn them. On the days when he took as much alcohol as one would get in from one and one-half to three glasses of beer, it took him on the average 18 per cent longer to learn the lines than when no alcohol was taken. Six months later, when he reviewed and relearned the same lines, he found that the lines learned on the alcohol days required more time for relearning. Matter learned when the brain is affected by alcohol does not make so sharp and clear an impression, and therefore is not so easily recalled.

A MAN MAY HARM HIMSELF BY DRINK WITHOUT EVER GETTING DRUNK.

Scholarship.—Even school boys and girls have been studied in the effort to learn the facts about alcohol and mental work.

A school director in Vienna, E. Bayer,¹² noticed that some of the

school children were unusually disorderly in school and backward in their studies. After studying about 1,000 for several years, he found that these children, as a rule, were given wine or beer or rum, in tea.

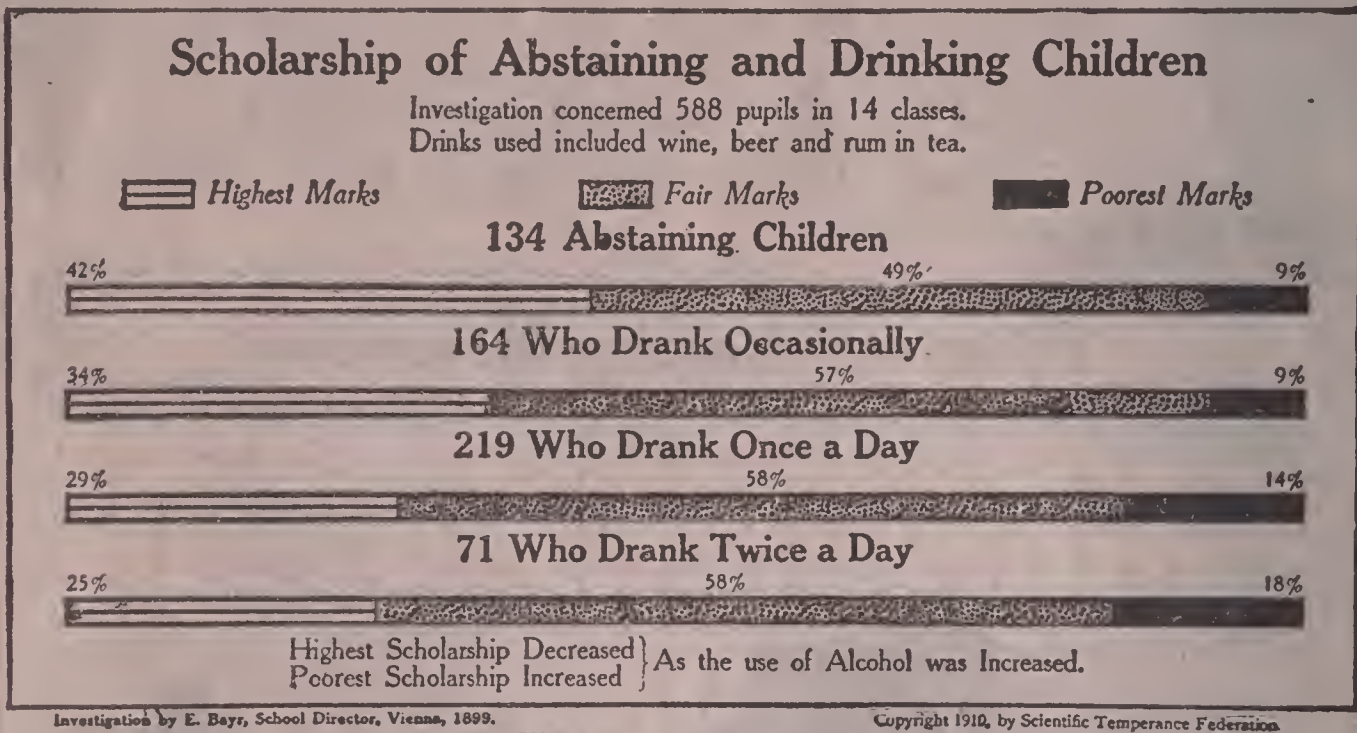


Fig. 7. See page 12.

Through the teachers, he learned the habits of 591 children as regards the use of alcohol, and obtained their reports on scholarship, which was ranked as “good,” “fair” and “poor.” (FIG. 7.)

Almost half of the 134 abstaining children had “good” marks. Only 12 of them had poor marks. With the drinking children, the more frequently they used wine or beer, the more the good marks fell off and the poor marks increased.

Four thousand Italian children¹³ in Brescia, Italy, were studied as to their use of alcohol. The following facts were discovered about their scholarship:

	462 Abstainers	1516 Drink Wine Occasionally	2,021 Drink Wine Daily
	Per cent	Per cent	Per cent
Good marks	42.66	30.5	29.8
Fair	53.49	41.8	39.7
Poor	3.85	27.	30.3

ALCOHOL IS A HANDICAP TO SCHOLARSHIP.

Brain Alertness.—Alcohol impairs perception. Young people sometimes try in sport to recognize as many objects as they can in a given time in passing a window, etc. To see and to recognize quickly requires keen activity of the brain. Alcohol has been found to impair this activity. In the tests made by Professor Krapelin, letters, syllables and figures were made to pass quickly before the eyes of a person, who was asked to tell what he saw. When alcohol had been taken, he failed more often to perceive all the characters that shot by, and he made more mistakes in naming them.

In reading aloud, after alcohol was taken, the reading was done more quickly but less correctly.

Mistakes in Answering Signals.—Alcohol was found, too, to impair ability to answer a signal correctly. The football team carries on its game by a series of signals which the quarterback gives. Every man on the team must know them and act in obedience the instant he hears them. In baseball, every motion of the ball is a signal to some player to act very quickly.

The effect of alcohol on the mental quickness in answering a signal has been studied with the help of delicate instruments. These can measure the time which it takes for the mind to receive and answer a signal down to the thousandth part of a second.

Many persons were tested many times. On some days they took alcohol, on others none, and the results were compared.

When, for example, a small flag was shown one of the persons tested, the instant he saw it he had to press an electric button. The time that passed after the signal was given until he pressed the button showed how quickly his mind was working.

When this was all that a man had to do, it was found that for a few minutes after taking as much alcohol as would be contained in one-third to one bottle of wine (claret, 10 per cent alcohol), he answered the signal more quickly than when no alcohol had been taken, but very soon in most cases he began to answer the signals more slowly, and this slower response lasted several hours.¹⁴

Sometimes, however, tests were made in which he had to decide which of two motions to make when he saw the signal, as an engineer, when a red light flashes out before him on the track ahead, must often decide in the fraction of a second what he will do to guide his train and passengers to safety. The tests were made in this way: If a green flag appeared before the man, he had to press an electric button at the right; if he saw a red flag, he must press a button at the left. For a short time after taking no more alcohol than that in a bottle of claret, he pressed the button more quickly, but he was more likely to press the wrong one—*he made more mistakes*.

With larger quantities of alcohol the mind always responded to the signal more slowly than without it.

These and other experiments showed how dangerous a drinking man may be in any business requiring the quick giving, receiving and answering of signals. ALCOHOL SLOWS THE CORRECT READING OF SIGNALS AND INCREASES LIABILITY TO MAKE MISTAKES.

Railroad Requirements.—It is partly for this reason that so many of the railroads in the United States require abstinence from all alco-

holic drinks on the part of the men who operate their trains. An engineer on the Lackawanna Road in 1912 who had been drinking the night before ran his train past three signals warning him to stop (FIG 8).



Photo by Amer. Press Assn.

Fig. 8. Railroad accident, Corning, N. Y. July 4, 1912. The engineer had been drinking.

"There is only one absolutely safe course to be followed by these classes of men (trainmen) and that is to abstain altogether from the use of liquor. That will be the rule of the Lackawanna hereafter."—Geo. A. Cullen, Passenger Traffic Manager.

He proved again by an unnecessary and tragic experiment that alcohol is liable to render one less able to perceive and act correctly upon signals, but his experiment cost 40 lives outright, and 75 more were injured.

After the accident on the Lackawanna Road, the managers issued the following rule: "Trainmen must not drink or enter saloons even when off duty."

DRINK AND ACCIDENTS.

The liability to accidents from the use of alcohol is by no means confined to railroads. Crowded streets, the use of swift machinery, powerful electrical currents multiply the demands for alert senses, clear and accurately working brains.

WANTED—A FIRST CLASS CHAUFFEUR.

One who has had large experience, never touches intoxicating liquors and can give very highest recommendations as to ability and character. A good opportunity for the right kind of man.

So ran a recent newspaper advertisement, signed by a member of one of the largest mercantile firms of New England.

Endangers Sober Workmen.—A tippling chauffeur endangers the life of everyone on his route. A factory hand, careless or inefficient through drink, may cause an explosion or other accident that destroys scores of his fellow-workmen.

"No man under the influence of alcohol even slightly should be permitted to remain in the works, much less to work," says a pamphlet issued by the Fidelity and Casualty Company.¹⁵ *"Nor should a man whose nerves have been rendered unsteady by the habitual use of alcohol or by a recent debauch be permitted to operate dangerous machinery or to carry on dangerous work. He endangers not only his own life but the lives of others."*

The Aetna Life Insurance Company said in a pamphlet in 1911:¹⁶ *"It is advisable not to employ, or to continue in employment, men who are known to be steady and hard drinkers. The regular use of intoxicants in any considerable quantity is bound in time to make a workman undesirable as regards both his liability to cause accident and his efficiency."*

The Habitual Drinker and Accidents.—The man who appears at a factory intoxicated is likely to be promptly sent home as unfit to work. But the man who is suffering from the effects of heavy drinking of the day before may show no signs of it and yet not be in complete control of himself.

The habitual drinker presents, perhaps, the greatest danger. The quantities of alcohol he takes each day are not enough to cause drunkenness, but they may, nevertheless, considerably reduce his alertness. Drinkers of both classes are liable to have less acute hearing and sight; the work of the mind is likely to be slowed. As a result, they may be less careful and accurate and slower to recognize danger. They are more liable by false or unsteady motion or inaccurate judgment to cause a serious accident to themselves and their fellow-workmen.

German accident insurance companies have shown that the hard drinker is injured more frequently than the average, recovers from injury more slowly, and therefore loses more time from work on this account, and that the death-rate from accidents is higher among heavy drinkers than the average accident death-rate.

WHERE BUSINESS TAKES A HAND.

Thus the drinker tends to become an unprofitable workman to his employer. His habit tends to lessen his endurance, to impair his skill, and to cause more accidents and sickness. The drinker who loses time because of his drink brings loss upon the employer not only for his own time but for that of other workmen. In a well-managed factory, each room is supposed to turn out daily a certain number of parts for the next room to finish. If two or three men are absent from a room, valuable machinery stands idle, the work expected is not finished for the next room, and so the routine of the whole factory may be more or less disorganized.

The young man entering business and industry today has to face the fact, therefore, that an increasing number of employers do not want him if he drinks a substance like alcohol that impairs memory, alertness, quickness, precision, judgment or self-control on the mental side, reduces strength and endurance on the physical side, and in general increases accidents and sickness and lost time.

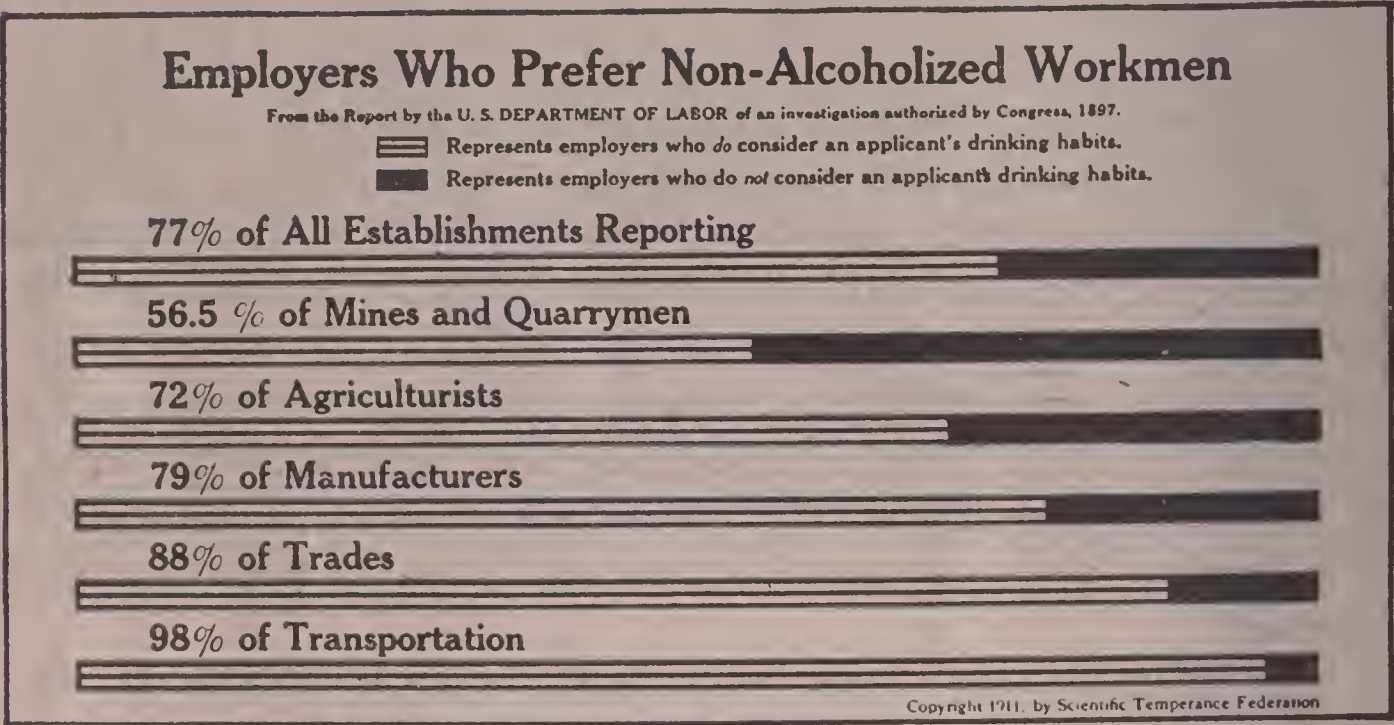


Fig. 9. See page 16.

Even fifteen years ago, employers were beginning to prefer the wholly sober man, as was shown by an inquiry by the United States Bureau of Labor. Of over 7,000 employers of labor, 77 per cent stated (FIG. 9) that in hiring men they wanted to know what were their habits as regards drink. Many refused to hire any but abstainers. Since that time, the perfection of swifter, more complex machinery has put the drinking man at a still greater disadvantage.

"I'll tell you what you ought to do," said the doctor to his employer friend. "You would find it a great saving in efficiency and accidents not to employ drinking men."

"I know it," answered the manufacturer, "but some of my older men are drinkers, and it wouldn't be fair to turn them off now at their age. It would be too hard for them to find another job."

"Probably you're right," agreed the doctor. "But I'll tell you what you can do. You can refuse to take on any new men, and especially young men, who are drinkers." THE DOORS OF OPPORTUNITY ARE CLOSING TO THE DRINKER.

THE MEANING OF DISORDERED BRAIN CELLS IN CRIME.

Brain cells disordered by alcohol often lead to crime, although not all persons are affected alike or to the same extent, so that not everyone who drinks commits crime. Yet there is enough chargeable to

alcohol to make it a very serious matter to society. In the signal tests after the use of alcohol, the muscles moved more quickly, but the man made more mistakes, that is, he failed to consider properly what he was to do. *The sober man thinks first and then acts; the man under the influence of alcohol often acts first and thinks afterwards.* The "signal" to him may be a gesture; his "response," a blow with the fist or a knife, a cut, a stab, or a shot, and he is arrested for assault, or even, perhaps, some more serious offense, due to the fact that his brain cells were not working properly because of the alcohol. The man who is "dead drunk" is too stupid to do the same amount of damage. Thus it is found that the kinds of crimes most frequently traceable to drink are blows, wounds, assaults, those that result from irritability such as is promoted by comparatively slight intoxication. It tends to turn a man who ordinarily restrains himself into the "hair-trigger type" of man. (Abel.)¹⁴

Judge Ivory C. Kimball, of Washington, D. C., testified at a Senate Committee hearing in 1912 that in 19 years' service as a police court judge he had tried about 150,000 cases, and not less than 75 per cent, in his judgment, were due directly or indirectly to drink.¹⁷

The Committee of Fifty, studying 13,402 convicts in twelve states,¹⁸ reached the conclusion that drink contributed to 49 per cent of the crimes against property; to 51 per cent of the crimes against the person (blows, wounds, etc.), and to 47 per cent of all other crimes.

The Emperor of Germany says:¹⁹ "In my reign of 22 years, of the great number of crimes which have been appealed to me for decision, nine-tenths were due to alcohol."

Besides the crime due to drink, the brain and nerves disordered by alcohol in drunkenness cause arrests and convictions for drunkenness. Sixty-three per cent of all arrests in Massachusetts in 1911 were for drunkenness alone.²⁰ When to this is added the crime already described as caused by alcohol-disordered brains, it is evident that drink is responsible for a very large part of the work of the police, the courts, the jails, and the prisons.

INSANITY.

An army of more than 30,000 insane persons in the United States whose insanity is due wholly or partly to alcohol—so runs the estimate.²¹ This means that at least one case of every five of insanity is chargeable directly or indirectly to drink. Official statistics from six Massachusetts insane hospitals in 1906 attribute 20 per cent of the admissions to this influence of alcohol. It was held responsible for over 28 per cent of the patients in New York State Insane Hospitals in 1910. "One insane person costs a loss to the state of nearly \$400 a year. The total loss in money to the state of New York by alcoholic insanity must,

therefore, be \$2,400,000, and to the United States \$12,000,000 every year."²¹

The children of alcohol users sometimes show nervous weakness which eventually develops into insanity, or if there is mental instability



Fig. 10. Actual changes in brain and nerve cells are sometimes produced by continued heavy drinking. At the left is a normal nerve cell. The "branches" and "twigs" are the paths by which brain messages go from cell to cell.

At the right is a cell that has been damaged by the continued heavy use of alcohol. The center is irregular, the "branches" and "twigs" are breaking down. Sometimes even the central portion of the cell may be destroyed. Such changes may not take place in every drinker or to the same extent in all cells, but a perfectly working brain is impossible with damaged cells. "Long before the cells show change in form, they may show change in action."

for any reason, the use of alcohol may bring on insanity which otherwise would not have appeared.

ALCOHOL AND HEALTH.

To hold a secure place in the working world a man must be dependable, regularly in his place, and in fit condition to work. Frequent absences on account of sickness detract from his value in any situation, besides reducing his own income. ALCOHOL INCREASES LIABILITY TO SICKNESS.

Drinkers Lose More Time by Sickness.—In England and Australia there are large sick benefit societies, the members of which are abstainers. When the records of these societies were compared with the sickness of benefit societies which do not require abstinence (FIG. 11), the members in the abstaining societies were found²² to have only about half as much sickness as those in the non-abstaining societies. The duration of sickness was important also, for the abstainers were away from work on the average 6.4 weeks, but members in the societies not requiring abstinence, 10.9 weeks. If the members earned when well an average of \$12 a week, this would mean a wage loss during sickness of \$76.80 for an abstainer, but a loss of \$130.80 for a non-abstainer.

Certain German sick benefit societies²³ have placed the hard drinkers in a group by themselves for study, and found that they had many more sick days than the average, and therefore cost the societies more in benefits. Because of this, all insured persons had to pay a higher rate for their sickness insurance than would have been necessary if there had not been this class of heavy drinkers who had extra days of sickness. The sober men had to pay the difference.

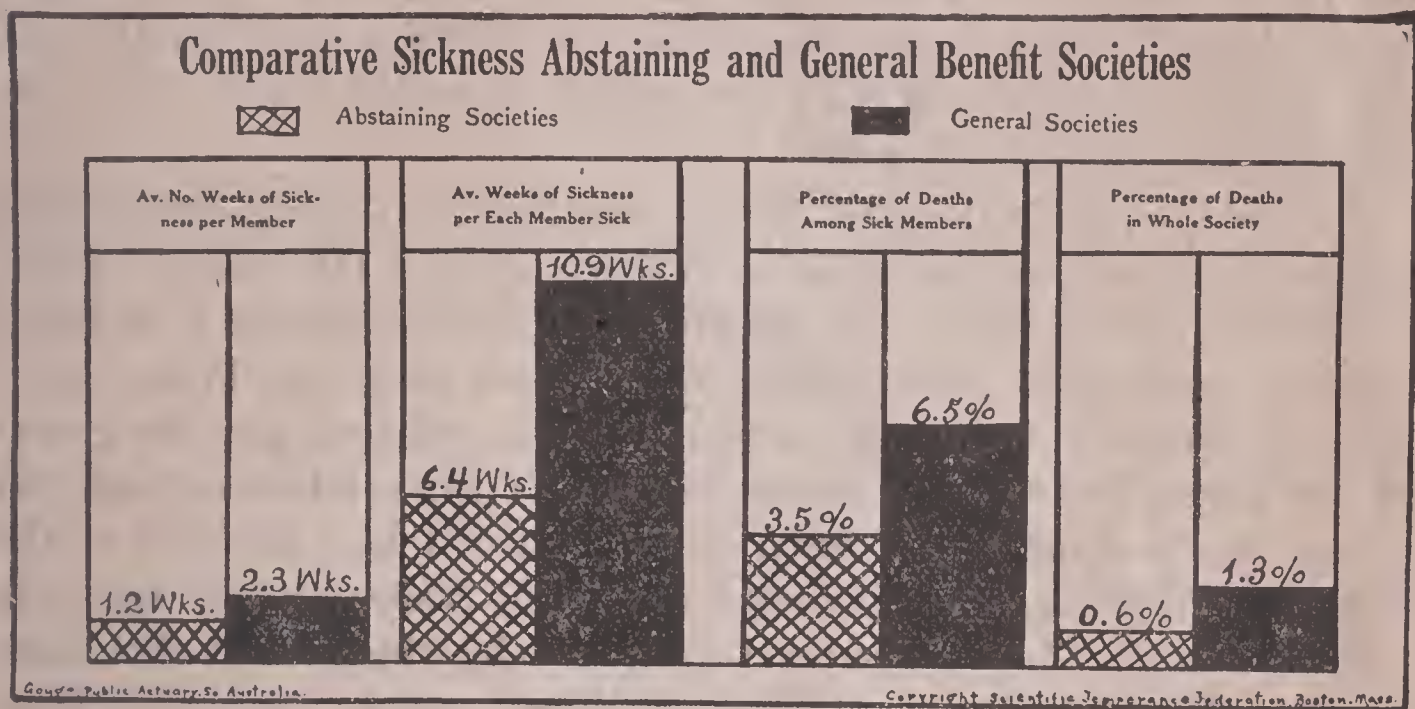


Fig. 11. The abstaining societies had abstaining members only. The general societies did not require abstinence. The abstainers averaged only about one-half as much sickness as members in general societies; when sick they recovered sooner, and only about half as many died. The death-rate in abstainers' societies was less than half the death-rate in the general societies. See page 18.

Reduces Resistance to Disease.—Alcohol also makes one more susceptible especially to infectious diseases. In the world around us are bodily enemies, disease germs, ever gaining entrance to the body through water, milk, ice, food, dust and air. Within the body are defenses, the white blood corpuscles and others, intended to destroy the disease germs if they gain lodgment, or the poisons which they generate. When the body is weakened by cold or over-work or lack of food, these bodily defenses are impaired and do not fully protect against disease. Alcohol also has been proven to impair the resistance of these bodily defenses,²⁴ and even to paralyze, as it were, the activity of the white blood corpuscles, so that at the very time they are most needed they fail in the drinker to give him full protection. At the same time the invading disease germs seem to be less affected by the alcohol than the white corpuscles. In great epidemics of cholera and yellow fever it was long ago noticed that the drinkers were apt to succumb early, although the reasons were not then understood as now. In diseases like erysipelas and pneumonia, the course of the disease in the habitual user of alcohol is liable to be much more serious than in non-drinkers.

TWIN ENEMIES—ALCOHOL AND TUBERCULOSIS.

War to the finish has been declared on the tuberculosis germ. Since it was discovered, doctors and boards of health, schools and tuberculosis societies have been warring against it trying to destroy it and keep it from multiplying.

That, however, is not all of the battle. A very important part is so to strengthen the body that the disease germs which are all about us can get no chance to develop within it. A healthy skin on the outside of the body, healthy membranes lining the cavities, good food, fresh air, sunlight, exercise—all these are needed to enable one to resist the onslaught of the invisible germ.

Drink Prepares the Soil for Tuberculosis.—Among unhealthful habits which make one more liable to tuberculosis is the alcoholic habit. It tends to set up inflamed conditions of the air passages, or often leads to carelessness about taking colds which make the lining membrane of the air passages still more unhealthy, and thus give the germs of the disease a better chance to develop. It may interfere with the proper nourishment of the body, and so make it less resistant to the disease. “ALCOHOL,” said a French physician, “PREPARES THE SOIL FOR TUBERCULOSIS.” There are indirect routes also by which the alcohol habit permits tuberculosis to get established. When money is spent for drink it often means that there is less to spend for good food, a healthful home or adequate clothing, and the lack of these conditions for good health makes it easier to contract the disease.

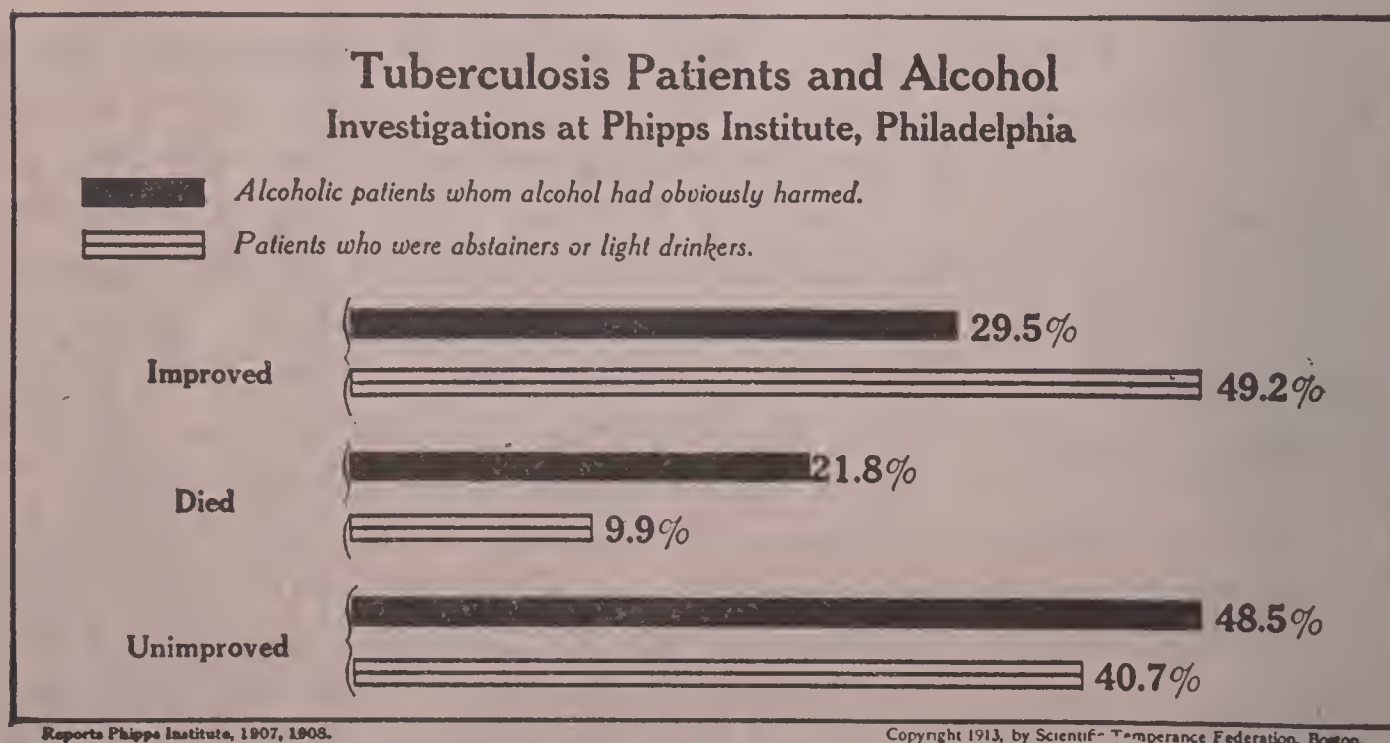


Fig. 12. “From the facts before us, alcohol is exceedingly dangerous to the tuberculous. The only safe rule is to abstain from it altogether.”—Report Phipps Institute, 1908.

Tuberculosis Treatment Handicapped by Alcoholic Habits.—The Phipps Institute in Philadelphia recorded for several years the habit of

each patient and of his parents in regard to the use of alcohol and the progress of the cases. The abstainers were not grouped by themselves, so the Institute records give no opportunity of comparing them with non-abstainers. But when the alcoholic patients, those who had used enough alcohol to do themselves obvious physical harm, were compared with the group of lighter drinkers and abstainers, it was found (FIG. 12) that the alcoholic tuberculous patients showed a smaller percentage of cases in which there was an improvement; a larger percentage of them died or were unimproved.

The International Tuberculosis Congress in 1905 declared that, "In view of the close connection between alcoholism and tuberculosis, this Congress strongly emphasizes the importance of combining the fight against tuberculosis with the struggle against alcoholism."

DANGEROUS OCCUPATIONS MADE MORE DANGEROUS BY DRINK.

In certain kinds of work alcohol is especially liable to disable the worker through sickness because it intensifies the danger involved in the work itself.

Lead-Poisoning.—Those who work with lead, painters and paint-makers, etc., are far more liable to lead-poisoning if drinkers than if abstainers.²⁵ The natural resistance of the body is taxed in trying to overcome the effects caused by the lead. When the injury caused by alcohol is added, the forces of resistance are overcome more quickly than if only one enemy at a time has to be met.

Exposure to Heat.—Men working in extreme heat are more liable to heat prostration, if drinkers, partly because alcohol deadens sensibility and impairs judgment so that one is more apt to expose himself recklessly to heat, and partly because the effect of alcohol on the nervous system disorders the body's natural mechanism for protection against heat. Army experiences in India, Africa and other hot climates have shown that the alcohol-users are much more susceptible to heat, and that men using no alcohol at all better endured severe experiences, coming through in excellent health and with but few cases of sunstroke.

Drink and Cold Weather.—Teamsters and other men who have to work out of doors in cold weather often believe alcoholic drinks warm them. On the contrary, it really makes the body colder. They *feel* warmer for a short time because alcohol partly paralyzes the nerves controlling the blood vessels so that more warm blood flows through them close to the cold surface of the skin, but this blood returns to the interior of the body chilled, thus reducing the temperature of the body and making one more liable to take cold. Extra clothing, exercise and hot, non-alcoholic drinks are the best aids to warmth in cold weather.

DRINK'S COST IN LIVES.

One Death Every Eight Minutes Due to Drink.—All the world was shocked when the news came that the splendid steamship Titanic had carried down to death 1,662 persons (FIG. 13). Yet alcohol carries off 1,662 adults every nine days all the year round in the United States, 65,897 a year, according to the estimate of Edward Bunnell Phelps²⁶ based on the estimates of medical directors of three of the large Ameri-



Photo by Amer. Press Assn.

Fig. 13. The Titanic carried down 1,662 persons. Alcohol is estimated to carry off 1,662 adults every nine days. Total for the year, 65,897 deaths wholly or partly due to drink.

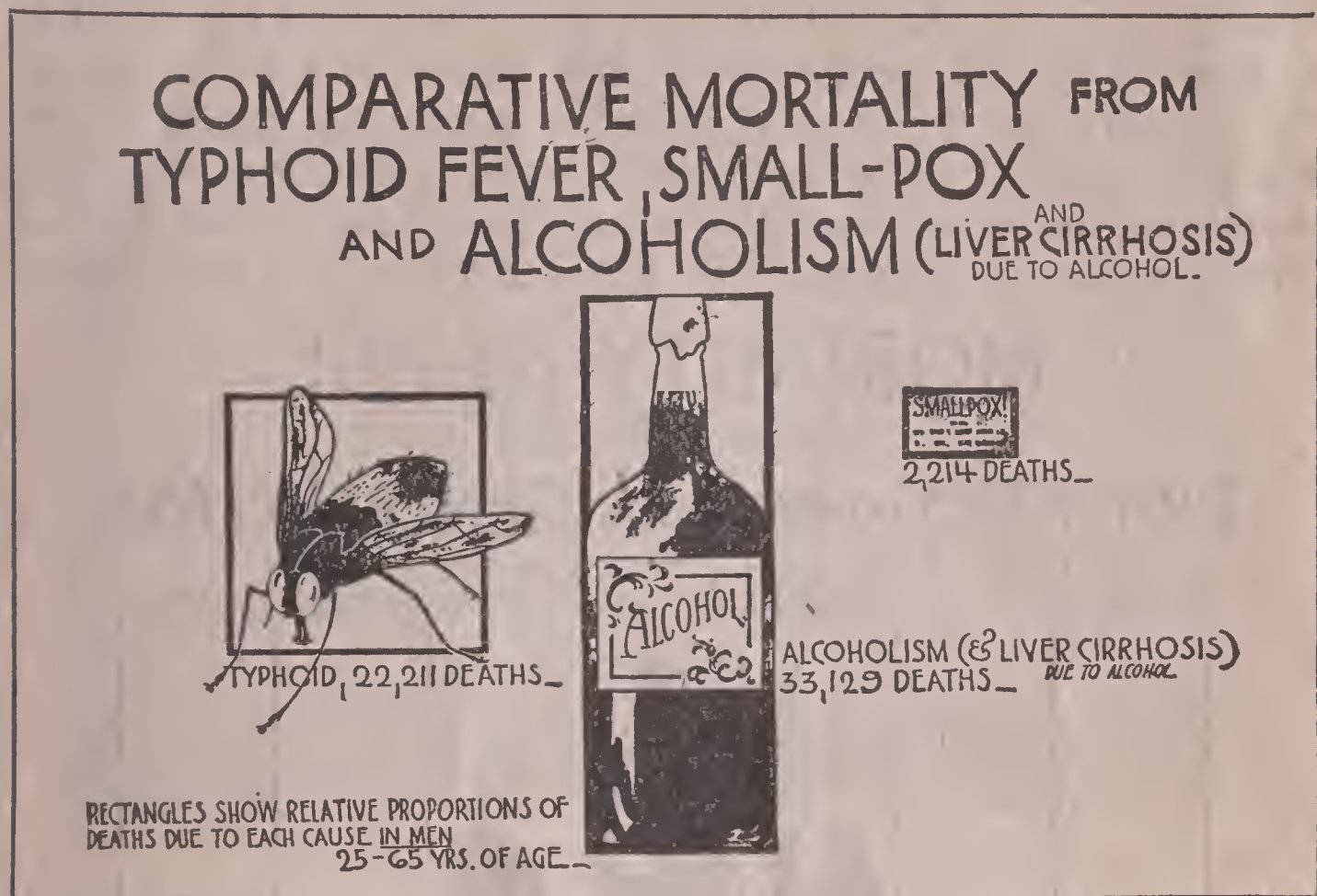
can life insurance companies. This means one adult death every eight minutes due directly or indirectly to alcoholic drinks, one out of every 7.5 adult male deaths.²⁷

Drink's Toll in Special Diseases.—It was estimated that 10 to 12 per cent of the deaths from tuberculosis are due wholly or partly to drink; 22 per cent of the deaths from pneumonia, paralysis and apoplexy; 30 per cent of the deaths from Bright's disease; 16 per cent of the deaths from heart disease; 43 per cent of the deaths from heat prostration, and, of course, all the deaths from alcoholism.

Typhoid and smallpox are dreaded diseases. In 8 years, 1900-1908, smallpox carried off 2,214 men 25-65 years of age in the registration area of the United States (FIG. 14). Typhoid carried off 22,211 men. But alcoholism, for which alcohol was wholly responsible—and the 75 per cent of liver cirrhosis which may be charged to alcohol, carried off 33,139 men; 10,928 more than typhoid, and more than fifteen times as many as smallpox. And these, alcoholism and liver cirrhosis, are only two of the 106 diseases in which alcohol may be one cause of death.

Further, these statistics cover only about one-half of the United States.²⁸

Abstainers' Better Chance of Long Life.—Life insurance statistics have shown convincingly the average longer life of the abstainer. In



U. S. Registration
Area, 1900-1908

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Fig. 14. Deaths represented as due to alcohol do not include the deaths in 104 other diseases which may be directly or indirectly due to drink. "Alcoholic indulgence stands almost, if not altogether in the front rank of the enemies to be combatted in the battle for health."—Prof. Wm. T. Sedgwick.

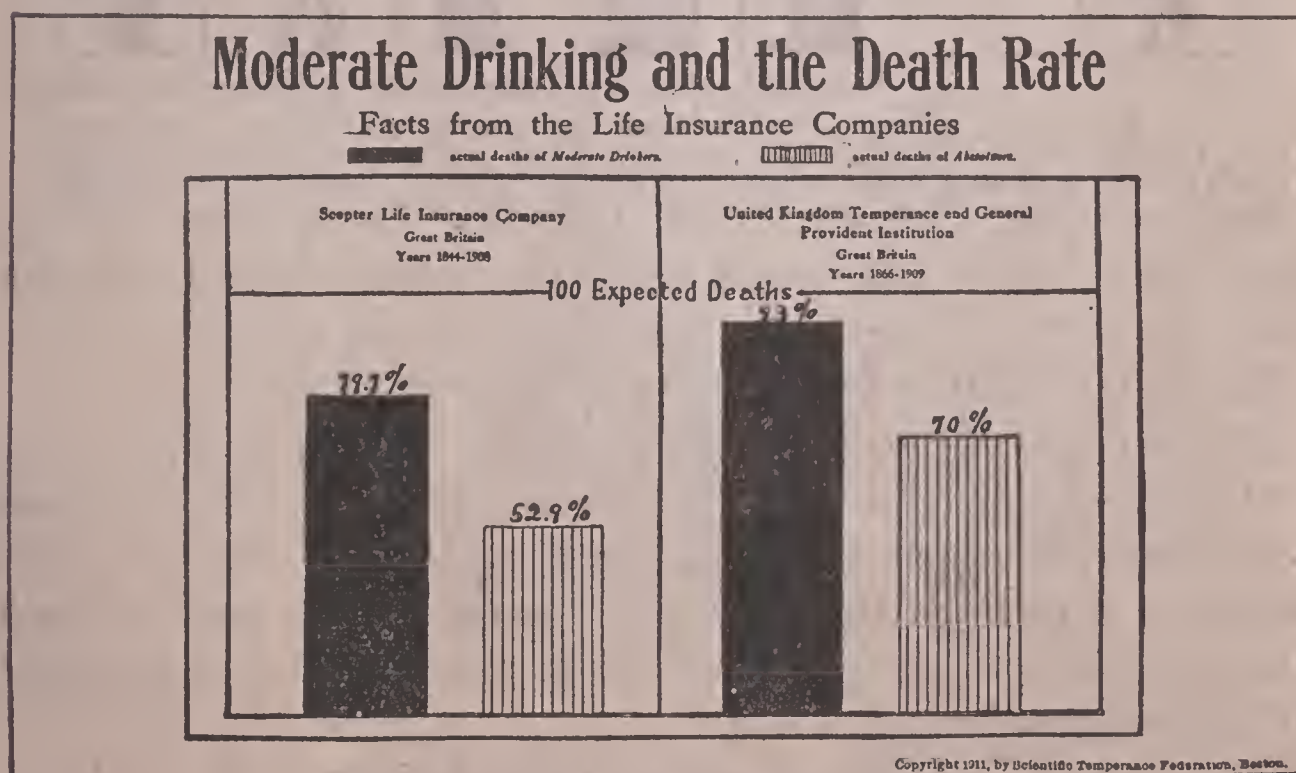


Fig. 15. See page 24.

some of the British life insurance companies, the abstainers' records for many years have been kept separately, and they can be compared with the death-rates of the non-abstainers. The experience of the

United Kingdom Temperance and General Provident Institution for 35 years, 1866-1909, showed (FIG. 15) that for every 100 deaths expected, 93 deaths actually occurred in the non-abstainers' section, but in the abstainers' section only 70 deaths occurred. They showed also that at 30 years of age the average insured man may be expected to live 35 years longer; but the average insured abstainer may expect to live 38.8 years longer.²⁹ The death-rate of the non-abstainers is greater than that of the abstainers at almost every age of adult life and greatest between the ages of 35 and 40—the prime of life, when a man is most

MORTALITY BY AGE OF DRINKERS COMPARED WITH GENERAL CLASS



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Fig. 16. The figure at the extreme left shows the average death-rate at each age period. For example, at ages 35-44 years, for every 100 deaths per 1,000 insured men, there were 290 per 1,000 in the "drinkers"—Those who showed some effect of their use of alcohol. (Leipsig Sick Benefit Societies, 1910.)

needed by his family and should be of the highest value to the community.

ALCOHOL-CAUSED DISEASE IS PREVENTABLE DISEASE.

Drinkers' Death-Rate Far Higher by Age Periods.—Similar facts were shown by German insurance companies (FIG. 16) which compared the death-rate of the class of men called "drinkers" with the general death-rate. At each age the "drinkers" exceeded the average mortality, and in the prime of life, age period 35-44, their death-rate was nearly three times as great as the average.²³

A WASTE OF CHILD LIFE.

"Every ten seconds a baby dies," is an estimate for the whole world. ³⁰In the United States alone, not far from 250,000 babies died in 1909, or one baby every two minutes.

Mortality of Children of DRINKING Mothers.

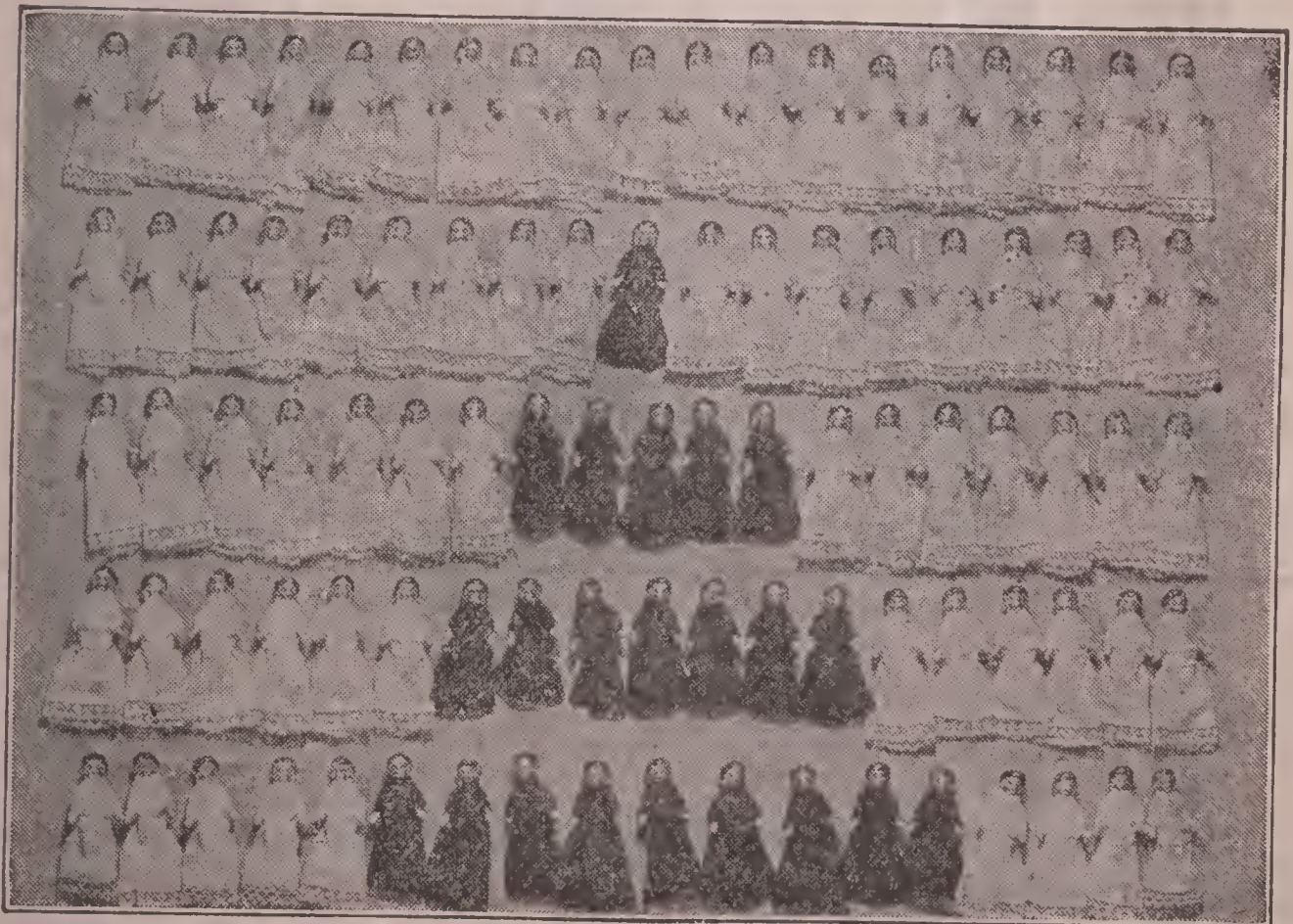
Children in Black Died Under Two Years—55 per cent



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Fig. 17. See page 26.

Mortality of Children of SOBER Mothers.

Children in Black Died Under Two Years—23 Per Cent



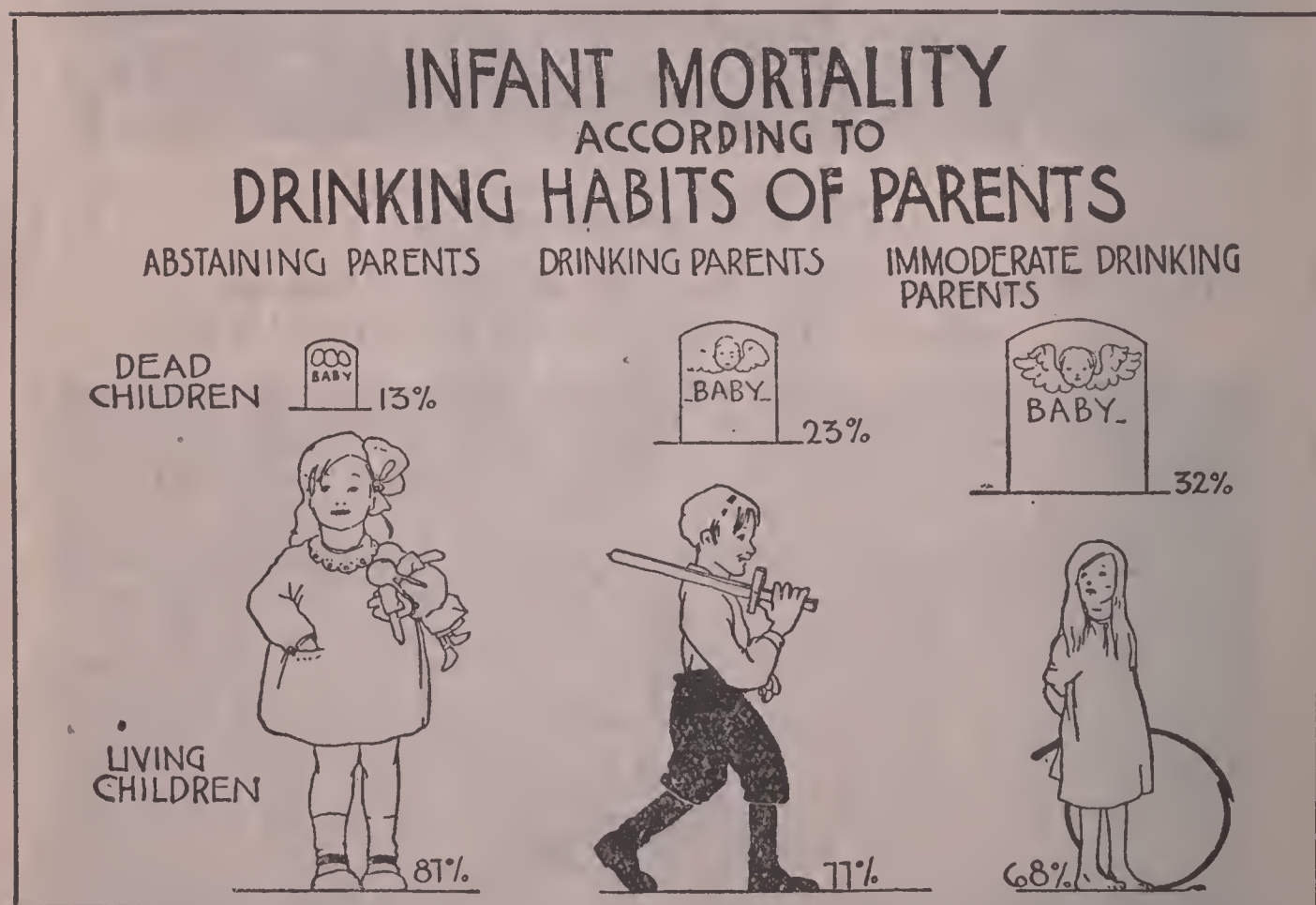
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Fig. 18. The sober mothers were relatives of the drinking mothers (Fig. 17) and had sober husbands.

This enormous loss of child life is due to many causes. Among them is the use of alcohol by the parents who did not know or realize the possible results to their little children, as it is only within a few years that the effects of drink have been so carefully studied.

Dr. Sullivan³¹ found that 120 drinking mothers of 600 children lost more than half of them before the children were two years of age (55.8 per cent). (FIG. 17.) When he compared 21 drinking mothers with 28 mothers who were their relatives but were sober and had sober husbands, he found that the sober women (FIG. 18) lost less than a quarter of their children (23 per cent).

Dr. Laitinen, in Finland, made inquiries about the deaths of children in 3,611 families which had had 17,394 children.³⁴ Where the parents were abstainers only 13 per cent of their children had died. The parents who were "moderate" drinkers lost 23 per cent; and the heavy drinkers lost 32 per cent. (FIG. 19.)



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Fig. 19.

"Abstainers" were persons who had never used alcoholic drinks, or at least since marriage. "Drinking" parents used no more alcohol than corresponds to one glass daily of 4 per cent beer. "Immoderate" drinking parents drank daily more than the equivalent of one glass of 4 per cent beer.

When there is this higher death-rate in families of drinkers, it is due partly to the fact that the children are less strong physically, and partly to the fact that they may not have proper food, clothing, warmth, and shelter, since when money is spent for drink there is less to spend on these other things which help keep good health.

What Animal Lives Tell Us.—In studying the death-rate of children in human families of drinkers and abstainers it is sometimes difficult to be sure that all the differences except the use of alcoholic liquors have been excluded. Hence a number of studies have been made with animals because they can be kept in two separate groups, one given alcohol, the other none, and, treated just alike, the results can be carefully compared. Practically all of these have shown a higher death-rate in the young of the alcohol animals.

Dr. Stockard,³² of Cornell Medical School, for several years has been studying guinea-pig families, comparing those in which one or both parents had alcohol with those where the parents had none.

The alcoholized guinea-pigs had in all 32 young, 25 of which died. Of the seven living, 5 were stunted. The parents who were given no alcohol had 17 young and lost not one. All were strong, healthy, and vigorous.

Stock raisers know how to care for their cows, horses, and sheep so that they lose very few young animals. The experimenters have shown that even when animals are given particularly good care in all other respects but are given alcohol, a large part of their young die, confirming the observation that very often human parents who use alcoholic drinks lose a larger proportion of young children than abstaining parents.

A German doctor lately said that though we learn to fly, talk by wireless, and visit the earth's poles, we have no reason to boast of our knowledge while we fail to prevent the needless loss of so many little children.

Some Lives Spoiled by Drink.—Sometimes children grow up into men and women whose bodies are not strong and perfect, or minds as keen and bright as they should be. Some have defects of the brain and nervous system and become insane. Some never are able to learn the difference between right and wrong, or if they know, do not have enough self-control to keep from doing wrong, such as stealing, injuring others, or destroying property.

There are many reasons why such a large number of people are defective, but the studies of many physicians have led them to believe that in many cases drinking by parents is responsible for the condition of these children.

Dr. Demme, of Berne, Switzerland,³³ for example, studied carefully for fifteen years 10 temperate and 10 intemperate families living under as nearly as possible the same circumstances except for the use of alcohol by one or both parents in the intemperate families (FIG. 20.). Of the 61 children in the temperate families, there were

50 living, normal children. Of the 57 children in the intemperate families, only 10 were living and normal.

Dr. Laitinen, of Finland, compared 50 abstaining and 59 drinking families living under similar conditions. The abstaining parents had 1.3 per cent of weakly children; the drinking parents 8.2 per cent, more than six times as many.⁴⁰

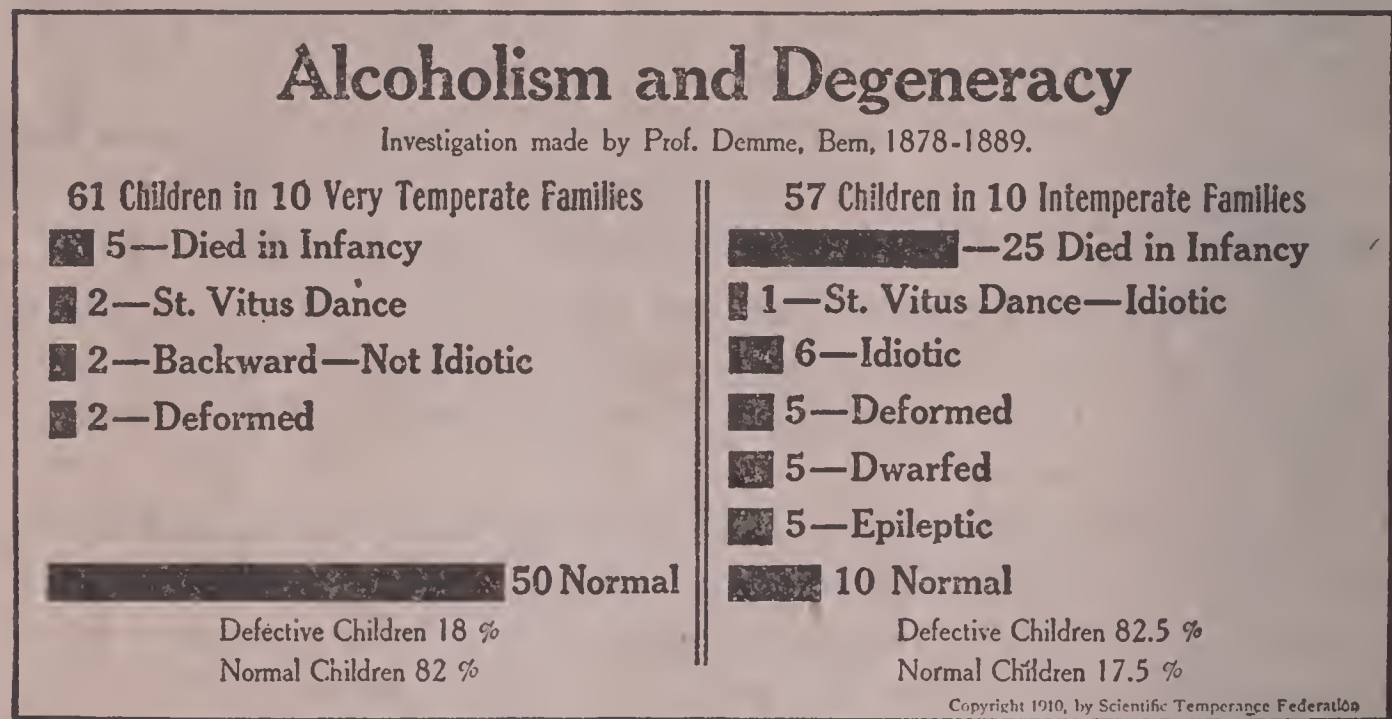


Fig 20. See page 27.

Brings Out Latent Defects.—Thus the effect of alcohol on the children of the drinker may be even more serious than upon himself, because many of these defects once started, tend to perpetuate themselves in one form or another from generation to generation. Further, alcohol seems to be able not only to start defects by injuring the delicate cells in which a human life begins, but where there is for any reason a weak, nervous system, alcohol is liable to bring out and intensify defects that otherwise would have remained latent.

This does not mean that all the children of a drinker must be or are defective. Nature, if given a chance, is always trying to build up a sturdy human race. It does mean that they must take the greater pains to keep themselves well and to abstain from alcoholic drinks.

DRINK’S BURDEN ON SOCIETY.

Out of the effects of alcohol on body and mind grow certain other serious consequences to society as a whole. (FIG. 21.).

The Road to Poverty.—The pay envelope often suffers as the consequence of the worker’s drink habit upon his efficiency, skill and carefulness. Some German societies which pay insurance to employees when out of work found that³⁵ on the average when a man reached the point where his drink was doing him physical harm that could be observed by the physician, he grew more and more irregular in employment. He was out of work more days in a year,

stayed less often in one place, changed places more frequently, and gradually tended to sink from the better paying positions requiring skill to the ranks of less skilled labor and with a corresponding decrease in wages. The alcoholic habit cuts into the family purse both ways. It takes the money spent for the drink itself; it also impairs the actual ability to earn money, and, further, it increases the family expense for sickness and accidents.

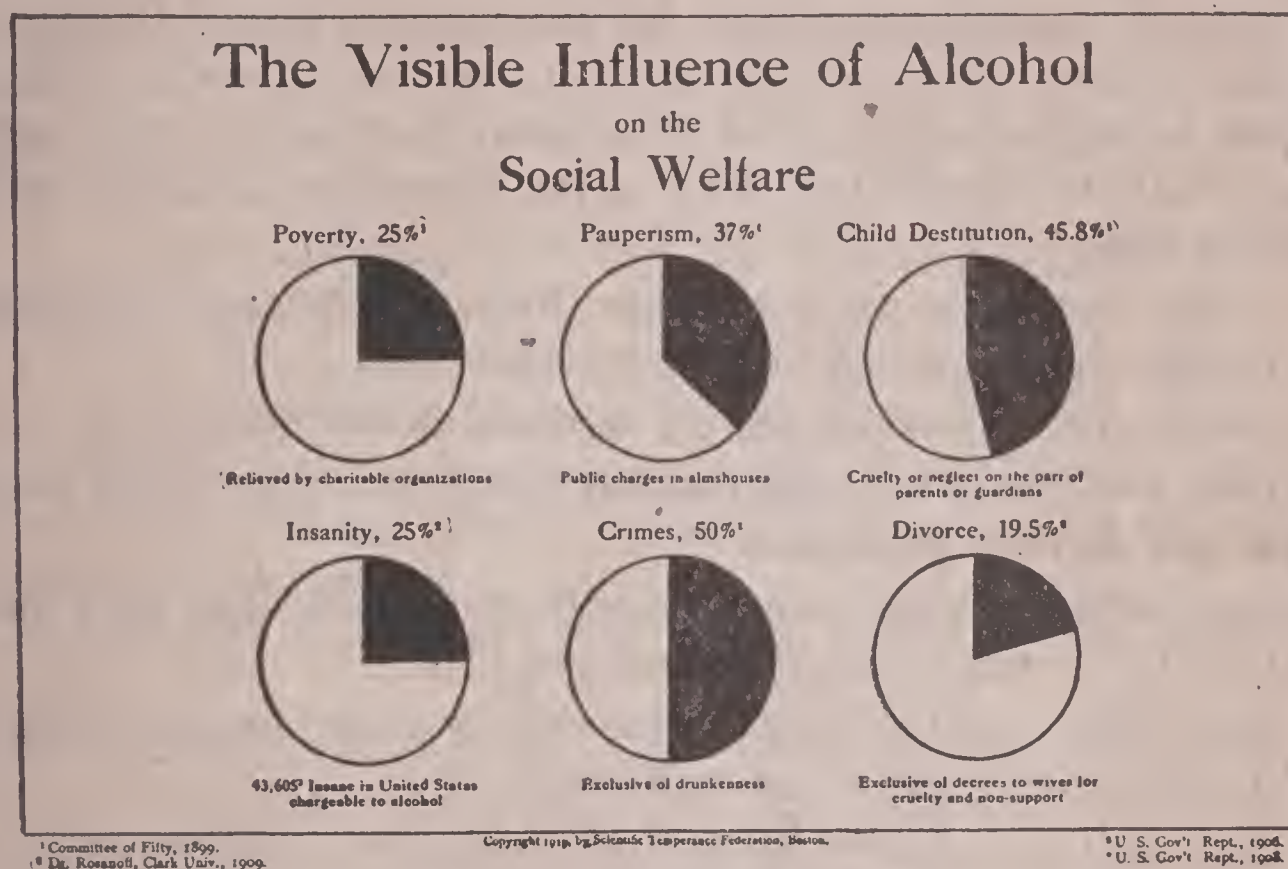


Fig. 21.

Hence, a large proportion of poverty is traceable, directly or indirectly to drink. The Committee of Fifty, after making inquiries in different parts of the United States, concluded that not less than one-fourth of the poverty and 37 per cent of the pauperism were the result of intemperance.¹⁸

A study in Boston of 352 able-bodied men who failed to support their families, showed that 65 per cent (243) were drunkards,³⁶ and that intemperance was the chief reason for the non-support.

Breaks Up the Home.—Drink is responsible for at least half of the neglect and destitution of children. Three-quarters of the cases of children cared for by the Chicago Juvenile Protective Association³⁷ in 1911 grew out of alcoholism in the parent or guardian.

Intemperance breaks up many homes by divorce. One divorce in every five in the United States is caused directly or indirectly by intemperance, while in divorces granted to women, intemperance is the cause of one in every four.³⁸

All these consequences of drink throw a heavy burden of expense on the taxpayer and philanthropist in caring for the inefficient, the sick, the poor, the neglected, the insane and defectives brought to their con-

dition through the use of alcohol by themselves or by someone closely associated with them. SOCIAL DRINKING CUSTOMS LEAD TO SOCIAL WASTE.

SOME SPECIAL FACTS.

Is Beer Liquid Bread?—There is a common idea that alcoholic drinks may be used in place of food by a healthy person, that the malt liquors especially are nourishing, that beer is “liquid bread.”

Even if we admit that there is a little nutriment in beer, to get any practical amount of nourishment from it one cannot escape getting a harmful amount of alcohol, and in addition there is the ever-present danger that the alcohol may lead to the formation of a destructive alcoholic habit.

In the amounts in which alcoholic drinks are generally consumed, they produce exactly opposite results from real food:

Food increases working power; alcoholic drinks decrease it.

Food aids one in enduring physical strain; alcoholic drinks hasten fatigue and decrease endurance.

Food helps one keep warm; alcoholic drinks make one more liable to chill or to freezing if exposed to extreme cold.

Food helps keep the body in condition to resist disease; alcoholic drinks weaken one's powers of resistance.

Medical Use of Alcohol Decreasing.—Many persons have used alcohol as a medicine, believing it necessary to keep it on hand for this purpose. But it should be known that a great change has taken place even in the practice of physicians in regard to such use. All physicians use far less than formerly. In the Massachusetts General Hospital,³⁹ for example, the expense per patient for alcoholic liquors fell from \$.46 in 1897 to only \$.13 in 1906, a decrease of about 70 per cent. All physicians believe, also, that if liquor is to be used at all medically, it should be taken as a drug and only on the prescription of a careful physician who understands conditions and gives his directions accordingly, just as in the case of any other drug, and especially of a habit-forming drug like alcohol. There is also a constantly increasing number of physicians who do not use alcohol at all as a medicine, believing that they get better and surer results by other means.

CONCLUSION.

From every point of view, the effects of alcoholic drinks on mind and body mean loss and waste. Their use begins largely in an old social custom, upheld by tradition from the days when the results were not understood as they should be now after the careful scientific studies of the past twenty years.

Not all persons are equally affected either in kind or amount of results, but the evidence goes to show certain definite results of the beverage use of alcoholic liquors:

1. Alcohol tends to reduce physical strength and endurance and the amount of work done.

2. It impairs mental work.

3. *Alcohol belongs to the class of habit-forming drugs*, like opium and morphine, which tend to create a craving for increasing amounts. In certain persons this leads inevitably to heavy drinking and its serious consequences.

4. The alcohol-user, on the average, is especially liable to sickness and to premature death.

5. Drink increases liability to accident even in the person who is never intoxicated.

6. The use of alcohol by parents is often responsible for a high death-rate in children, or for physical and mental defects.

7. Alcoholism does not necessarily mean drunkenness. The habitual user of alcohol may show some of its effects without ever reaching the stage of intoxication.

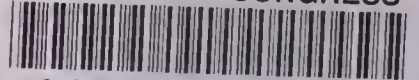
8. Alcohol is not a stimulant to the nervous system, but a depressant.

9. Because of the effects of alcohol on mind and body it is responsible directly and indirectly in the United States for at least one-fourth to one-half of all poverty and neglect, for more than one-third of pauperism, for one-fifth of the insanity and divorces, and one-half of the crime.

The facts contained in this pamphlet are no warrant for an inference by any child against the intelligence or good faith of a parent who uses alcoholic drinks, for such parent may be acting in accordance with public sentiment as to what was right and helpful in his locality at the time his habits were formed. But from generation to generation, with fuller knowledge, we make improvements in our manner of living as well as in methods of transportation and business. The new generation, acquainted with the facts of modern science on this question, many of them discovered since parents or grandparents were young, are in position intelligently to avoid those things in which the former generations were mistaken or which are a special handicap and disadvantage in our increasingly complex civilization.

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